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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,476	11/26/2001	Ari Juels	RSA-502AUS	7236

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EXAMINER
WILLIAMS, JEFFERY L

ART UNIT	PAPER NUMBER
2137	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/994,476	JUELS ET AL.	
	Examiner	Art Unit	
	Jeffery Williams	2137	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28 and 38-45* is/are pending in the application.

4a) Of the above claim(s) *29-37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28 and 38-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election of the Group II claims in the reply filed on 7/15/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 29 - 37 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group I, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/15/2005.

Claim Objections

Claim 2 is objected to because of the following informality: "coordinate set" should be written as "coordinate sets". Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1 – 28, and 40 – 45 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The language of the claim raises a question as to whether the claim is directed merely to an abstract idea that is not tied to a technological art, environment, or machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 3, 6 – 9, 11, 12, 14 – 17, 19 – 23, 26 – 28, and 38 – 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Alabbadi et al., "Integrated Security and Error Control for Communication Networks Using the McEliece Cryptosystem".

Regarding claim 19, Alabbadi et al. discloses:

receiving a first set of elements (Alabbadi; page 2, col. 1, "Encryption and encoding": Step 2);

and selecting a polynomial for encoding the item under the first set of elements to generate an order-invariant fuzzy commitment of the item (Alabbadi; page 2, col. 1, "Encryption and encoding": Step 3; page 1, col. 2, par. 3). Alabbadi discloses creating a commitment through the use of the polynomial despite when it would appear that the order of the elements has varied due to the introduction of bit errors.

Regarding claim 20, Alabbadi et al. discloses:

further including inserting chaff points that form a part of the commitment of the item (Alabbadi; page 1, col. 2, par. 2).

Regarding claim 21, Alabbadi et al. discloses:

receiving a second set of elements (Alabbadi, page 2, col. 1, "Encryption and encoding": Step 4 – "Decryption and decoding": Step 1); *and selectively decommitting the item based upon a level of overlap of the first and second sets of elements* (Alabbadi, page 2, col. 1, "Decryption and decoding": Step 2).

Regarding claim 22, Alabbadi et al. discloses:

further including determining the polynomial from the second set of elements if the level of overlap is greater than a predetermined threshold (Alabbadi, page 2, col. 1, "Setup": Step 1).

Regarding claim 23, Alabbadi et al. discloses:

further utilizing an error-correcting code for determining the polynomial (Alabbadi; page 1, col. 2, par. 3).

Regarding claim 26, Alabbadi et al. discloses:

further including utilizing a decodable design to decommit the item, wherein the decodable design includes constituent pairs of sets having a level of overlap less than a predetermined level (see rejections for claims 21 and 22).

Regarding claim 27, Alabbadi et al. discloses:

further including hiding the first set of elements in a target set containing a plurality of elements selected from a field (Alabbadi, page 1, col. 2, par. 2; "Encryption and encoding": Step 3).

Regarding claim 28, Alabbadi et al. discloses:

further including projecting the first set of elements onto the target set (Alabbadi, page 1, col. 2, par. 2; "Encryption and encoding": Step 3).

Regarding claim 1, Alabbadi et al. discloses:

(a) receiving a first input element comprising a sequence of a least one value $(a_1, \ldots, a_n)$ *from a predetermined set* (Alabbadi; page 2, col. 1, "Encryption and encoding": Step 2). Alabbadi et al. discloses receiving an input comprising a sequence of 'm' vectors from a predetermined set of 'M'.

(b) generating a codeword of an error-correcting code for generating the commitment (Alabbadi; page 1, col. 2, par. 3; page 2, col. 1, "Setup": Step 1).

(c) constructing a first sequence of coordinate sets (x_i, y_i), for i in {1,...n}, each of the coordinate sets having a first value (x_i) corresponding to a representation of an associated one (a_i) of the at least one value of the first input element and a second value (y_i) corresponding to a symbol in the codeword, wherein the symbol corresponds to the x_ith symbol in the codeword, wherein an order-invariant fuzzy commitment is formed (Alabbadi; page 1, col. 2, par. 3; page 2, col. 1, "Setup": Step 1; page 2, col. 1, "Encryption and encoding": Step 3;). Alabbadi et al. discloses that the input elements and their corresponding symbols in the codeword are mapped (committed) using a two dimensional matrix, thus creating the equivalent of the claimed "coordinate sets". The commitment is created despite when it would appear that the order of the elements has varied due to the introduction of bit errors.

Regarding claim 2, Alabbadi et al. discloses:

wherein the representation of the first value in the first sequence of coordinate set is an integer representation (Alabbadi; page 2, col. 1, "Encryption and encoding": Step 2). Alabbadi et al. discloses the first value to be a k – bit vector, or bit sequence.

Regarding claim 3, Alabbadi et al. discloses:

further including outputting the first sequence (Alabbadi, page 1, col. 2, par. 2; "Encryption and encoding": Step 4).

Regarding claim 6, it is rejected for the same reasons as claim 20.

Regarding claim 7, Alabbadi et al. discloses:

further including adding the chaff as sets of pairs of the form (x,y) such that x does not lie in the input sequence and y is generated at random (Alabbadi; page 1, col. 2, par. 2; page 2, col. 1, "Encryption and encoding": Step 4). Alabbadi et al. discloses the input of pairs of "chaff" elements. X representing intentional user errors of which do not lie in the input sequence, and Y representing channel noise occurring accidentally (random).

Regarding claim 8, Alabbadi et al. discloses:

further including adding the chaff as sets of pairs of the form (x,y) such that one or more values x do lie in the input sequence and y is generated at random (Alabbadi; page 1, col. 2, par. 7).

Regarding claim 9, Alabbadi et al. discloses:

further including reordering the first sequence based upon the first value (Alabbadi; page 2, col. 1, "Setup": Step 2). The first sequence in relation to the first value has been reordered via the permutation matrix.

Regarding claim 11, Alabbadi et al. discloses:

further including applying a bijective function to an input secret to obtain the codeword for the symbol corresponding to the second value (Alabbadi; page 2, col. 1, "Encryption and encoding": Step 3).

Regarding claim 12, the combination of Alabbadi et al. and Davida et al. disclose:

receiving the first sequence (Alabbadi; page 2, col. 1, "Encryption and encoding": Step 2; Davida et al., page 1, col. 1, Introduction; page 1, col. 2; pages 5, 7, and 8);

selecting a subset of the coordinate sets {(xi, yi)} in the first sequence (E) such that for each pair (x', y') in the subset, the first value in the pair (x') lies in the derived set of values (X') (Alabbadi; page 1, col. 2, par. 3; page 2, col. 1, "Setup": Step 1; page 2, col. 1, "Encryption and encoding": Step 3;). Alabbadi et al. discloses that the input elements and their corresponding symbols in the codeword are mapped (committed) using a two dimensional matrix, thus creating the equivalent of the claimed "coordinate sets";

receiving a second input element including a second sequence of a least one value ($b_1,\ldots, b_m$) from the predetermined set (Alabbadi; page 2, col. 1, "Encryption and encoding": Step 2; Davida et al., page 1, col. 1, Introduction; page 1, col. 2; pages 5, 7, and 8). The combination of Alabbadi et al. and Davida et al. show this second sequence to be the subsequent (after storing a biometric template during initialization) entry by the user of biometric data so as to authenticate himself to the system.

constructing a derived set of values ($X'= x_1',\ldots, x_m'$) representing respectively the at least one value ($b_1,\ldots, b_m$) in the second sequence (Alabbadi; page 2, col. 1, "Setup": Step 1; page 2, col. 1, "Encryption and encoding": Step 3). The combination of Alabbadi

et al. and Davida et al. discloses that the input elements and their corresponding symbols in the codeword are mapped (committed) using a two dimensional matrix, thus creating the equivalent of coordinate sets.

applying an error-correcting function to the subset (Alabbadi; page 2, col. 1, "Encryption and encoding": Step 3).

Regarding claim 14, it is rejected for the same reasons as claim 19.

Regarding claims 15 and 16, they are rejected for the same reasons as claim 26.

Regarding claim 17, it is rejected for the same reasons as claim 12.

Regarding claims 38 and 39, they are the computer readable medium embodying the code to implement the method of claims 1 and 12, and they are rejected for the same reasons as claims 1 and 12.

Regarding claim 40, it is rejected for the same reasons as claim 1.

Regarding claims 41, 42, 43, and 44, they contain limitations similar to claims 1 and 12 with the additional limitation of *"constructing a first sequence (E) of coordinate sets* $(x_i, z_{i,}, y_i)$*"* with z_i being *"a second value* (z_i) *constructed in a manner responsive to a pattern of occurrence of the associated one* (a_i) *of the at least one value of the first*

input element" . Thus claims 41, 42, 43, and 44, are rejected for the same reasons as claims 1 and 12, and further because Alabbadi et al. discloses the construction of a "coordinate set" comprising a second value (z_i). This second value is provided by the user for each element (m_i) of the first input sequence.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alabbadi et al.

Regarding claim 10, Alabbadi et al. discloses a method of reordering the first sequence based upon the first value (Alabbadi; page 2, col. 1, "Setup": Step 2). Randomly reordering the sequence would provide a level of obfuscation. Alabaddi does not disclose that the reordering is in ascending order based upon the first value.

However, it would have been obvious to one of ordinary skill in the art to recognize that various methods of reordering the sequence could be used, such as reordering in ascending order. This would be obvious because one of ordinary skill in

the art would have been motivated to provide a level of obfuscation to the original sequence and a technique such as reordering in ascending order would accomplish this.

Claims 13 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alabbadi et al. in view of Rao et al., "Private-Key Algebraic-Code Encryptions".

Regarding claim 24, Alabbadi et al. discloses the use of Goppa codes. However, Rao et al. discloses that this causes the system to become susceptible to attacks.

Rao et al. shows that one approach to prevent attacks is to use Reed – Solomon Codes instead.

Thus, it would have been obvious to one of ordinary skill in the art to employ the teaching of Rao et al. for utilizing a Reed-Solomon error detecting code in the system of Alabbadi et al. This would have been obvious because one of ordinary skill in the art would have been motivated to prevent attacks that would have resulted from employing a Goppa error detecting code.

Regarding claim 13, it is rejected for the same reasons as claim 24.

Claims 4, 5, 25, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alabbadi et al. in view of Davida et al., "On Enabling Secure Applications Through Off-Line Biometric Identification".

Regarding the following claims, Alabbadi et al. discloses a method of employing error correction within communication networks for the purpose of authenticating users to such networks (Alabbadi et al., page 1, "Introduction").

Davida et al. also discloses a method for employing error correction within a communication network for authenticating users to the network. For the purpose of increased security, Davida et al. discloses that it is advantageous to authenticate a user to such networks using the biometric data of the user, such as fingerprint, retinal scan, or iris scan information. In order to utilize the biometric data, Davida et al. discloses that potential users to the system must input a set a biometric data in the form of a biometric template. Then, upon a request for authorization, a user will supply to the system a second set of biometric data that will be compared to the template, the first set (Davida et al., page 1, col. 1, Introduction; page 1, col. 2; pages 5, 7, and 8).

It would have been obvious to one of ordinary skill in the art to employ the method of Davida et al. for supplying a biometric template within the system of Alabbadi et al. for authenticating a user to a communications network. This would have been obvious because one of ordinary skill in the art would have been motivated to provide increased security via the utilization of biometric data for authenticating users to a communications network.

Regarding claim 25, the combination of Alabbadi et al. and Davida et al. disclose: *wherein the first set of elements corresponds to a biometric template* (Davida et al., page 1, col. 1, Introduction; page 1, col. 2; pages 5, 7, and 8).

Regarding claims 4 and 5, they are rejected for the same reason as 25.

Regarding claim 45, it contains limitations similar to claims 1, 12, 41, 42, 43, and 44. However, the combination of Alabbadi et al. and Davida et al. does not disclose the receiving of a first input comprising two values, each value being derived from a separate predetermined set of values.

However, the combination of Alabbadi et al. and Davida et al. does disclose that a system for authenticating a using biometrics may use multiple types of biometrics. The combination discloses that a persons "biometric" for some biometric systems would comprise a iris scan and a finger scan (Davida; page 2, par.3; page 3, par. 5). Thus, the combination of Alabbadi et al. and Davida et al., suggests utilizing multiple types of biometrics to be entered by a user.

It would have been obvious to one of ordinary skill in the art to utilize in a biometric authentication system the receiving of a first input comprising two values, each value being derived from a separate predetermined set of values. The two values specifically being derived from a separate predetermined set of biometric values, such as an value for a fingerprint scan and a value for an iris scan. This would have been obvious because one of ordinary skill in the art would have been motivated to utilize

authentication inputs comprising two biometric values so as to increase the system's security with unique identification.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Rohatgi, "Commitments in Signatures", U.S. Patent 6,826,687.

Gopalakrishnan et al., "Mehtods and Apparatus for Restricting Access of a User Using Random Partial Biometrics", U.S. Patent 6,735,695.

Strait et al., "Method and System for Normalizing Biometric Variations to Authenticate Users From A Public Database and That Ensures Individual Biometric Data Privacy", U.S. Patent 6,038,315.

Bjorn, "Cryptographic Key Generation Using Biometric Data", U.S. Patent 6,035,398.

Golomb, S.W., "On the Classification of Boolean Functions", *Transactions of the Information Theory Group of the IEEE*, June, 1959.

Kilian, "Founding Cryptography on Oblivious Transfer", ACM, 1988.

Stern, "A new identification scheme based on syndrome decoding", Springer-Verlag, 1998.

Rick, "Observations on the Application of Error Correcting Codes to Public Key Encryption", IEEE, 1990.

Juels et al., "A Fuzzy Commitment Scheme", Proceedings of the 6th ACM conference on Computer and communications security, 1999.

A shortened statutory period for reply is set to expire **3** months (not less than 90 days) from the mailing date of this communication.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffery Williams whose telephone number is (571) 272-7965. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emmanuel Moise can be reached on (571) 272-3865. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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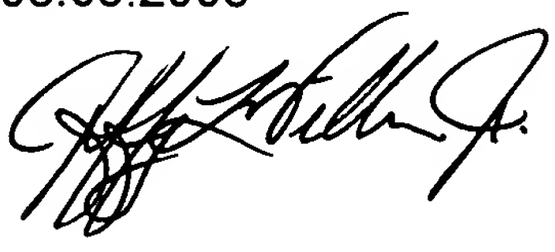
Art Unit 2137
08.05.2005



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